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ABSTRACT

Apollo 9, an earth orbiting mission during which the Lunar Module was first tested in space flight in preparation for the eventual moon landing missions, is the subject of this pamphlet. Many color photographs and diagrams of the Lunar Module and flight activities are included with a brief description of the mission. (PR)

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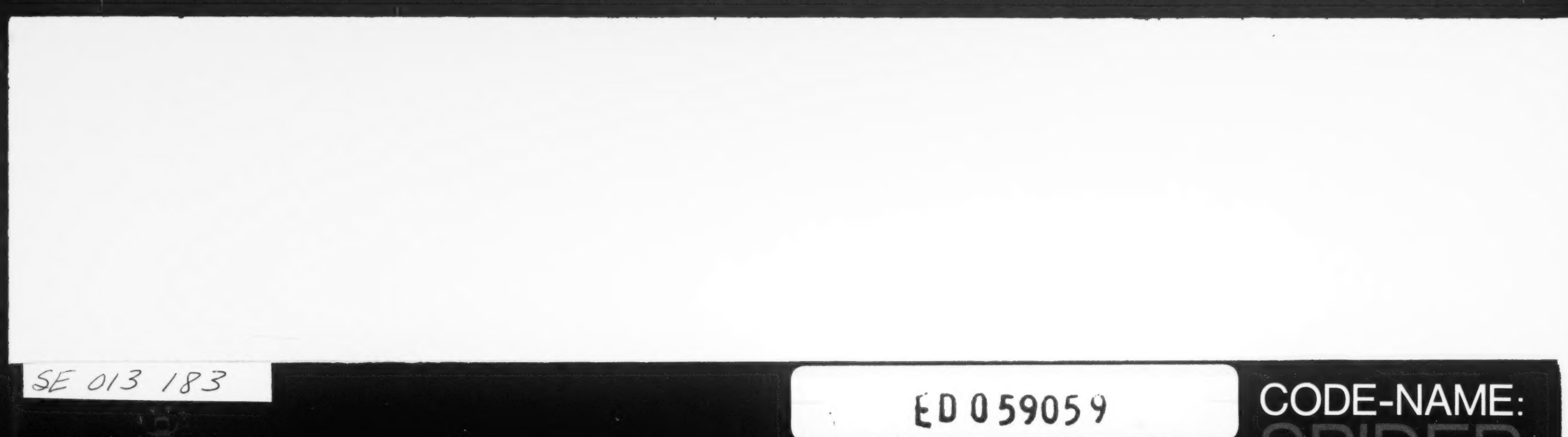
CODE-NAME: SPIDER

FLIGHT OF APOLLO 9



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1

Gumdrop Meets Spider

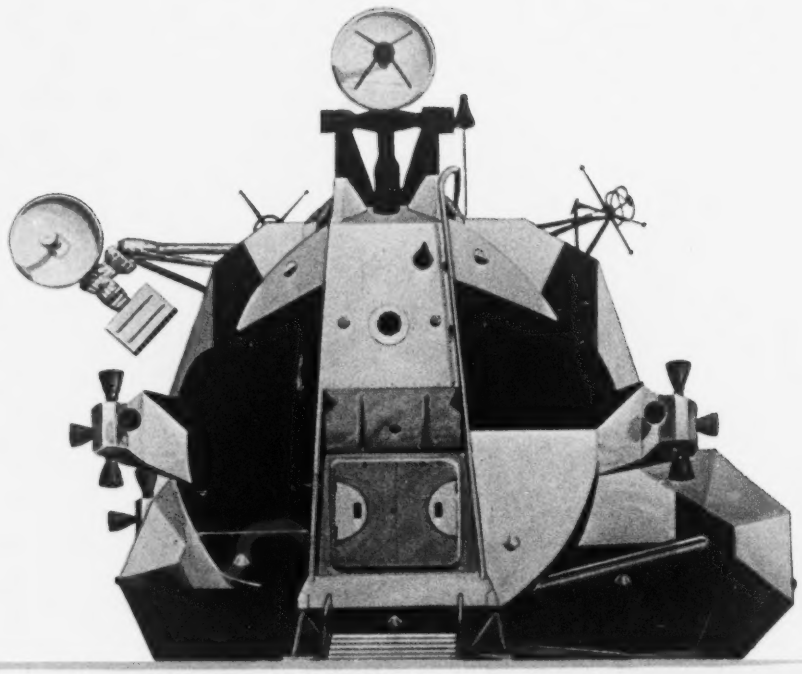
"You're the biggest, friendliest, funniest-looking spider I've ever seen."

That's how Astronaut David Scott, piloting Apollo 9's Command and Service Module (CSM), code-named Gumdrop, welcomed back the Lunar Module (LM), code-named Spider, from its first solo venture into space. Spider's hollow drogue, delicately guided by Astronauts James McDivitt and Russell Schweickart, found the docking probe on Gumdrop, and a buzzer signaled their union.

"Wow!" McDivitt exclaimed, "I haven't heard a sound that good for a long time."

And thus on March 7, 1969, the fifth day of the flight of Apollo 9, did Spider prove itself in space. Previous missions had tested the Saturn 5 launch vehicle and the CSM. A later one would test the LM in the vicinity of the Moon. But when Apollo 9 splashed down at the end of ten days in space in the water off Grand Turk Island in the Bahamas there was renewed confidence that before 1969 was out a Spider would land two Americans on the Moon.

Below from left to right, Lunar Module Pilot Russell Schweickart, Command Module Pilot David Scott and Commander James McDivitt. At the right, Lunar Module, Code-name: Spider.



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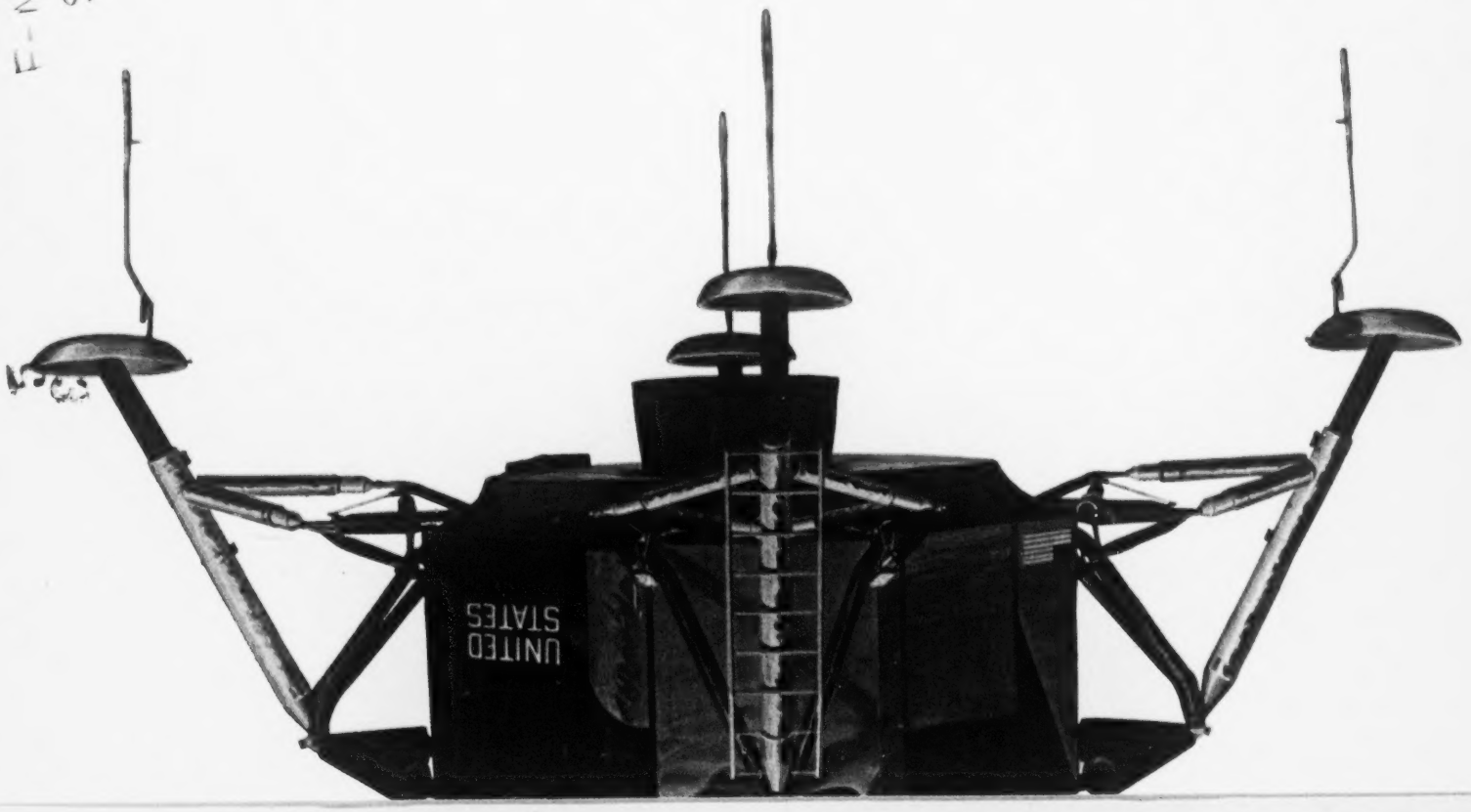
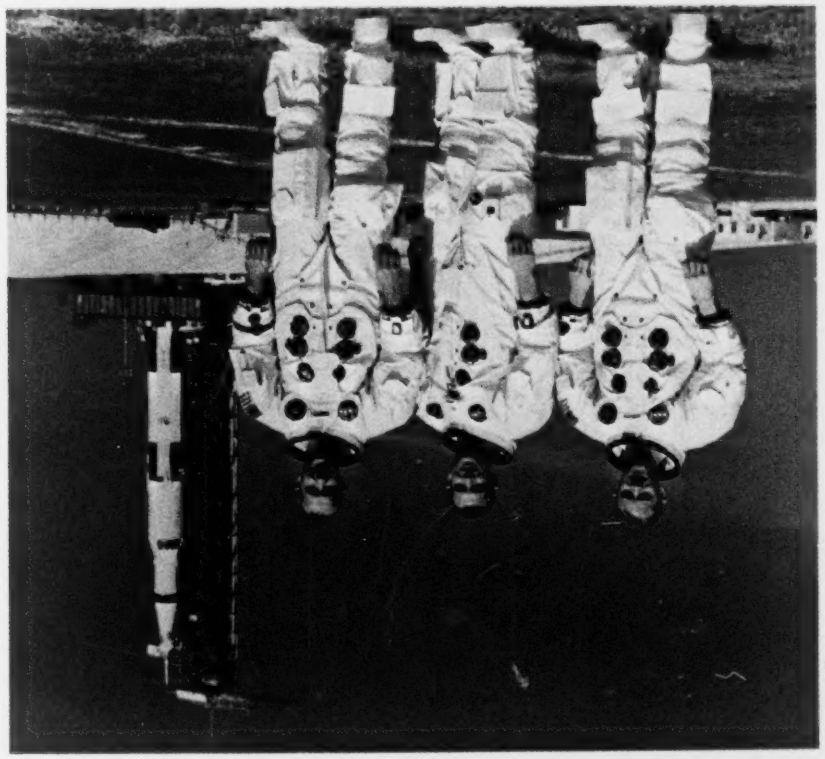




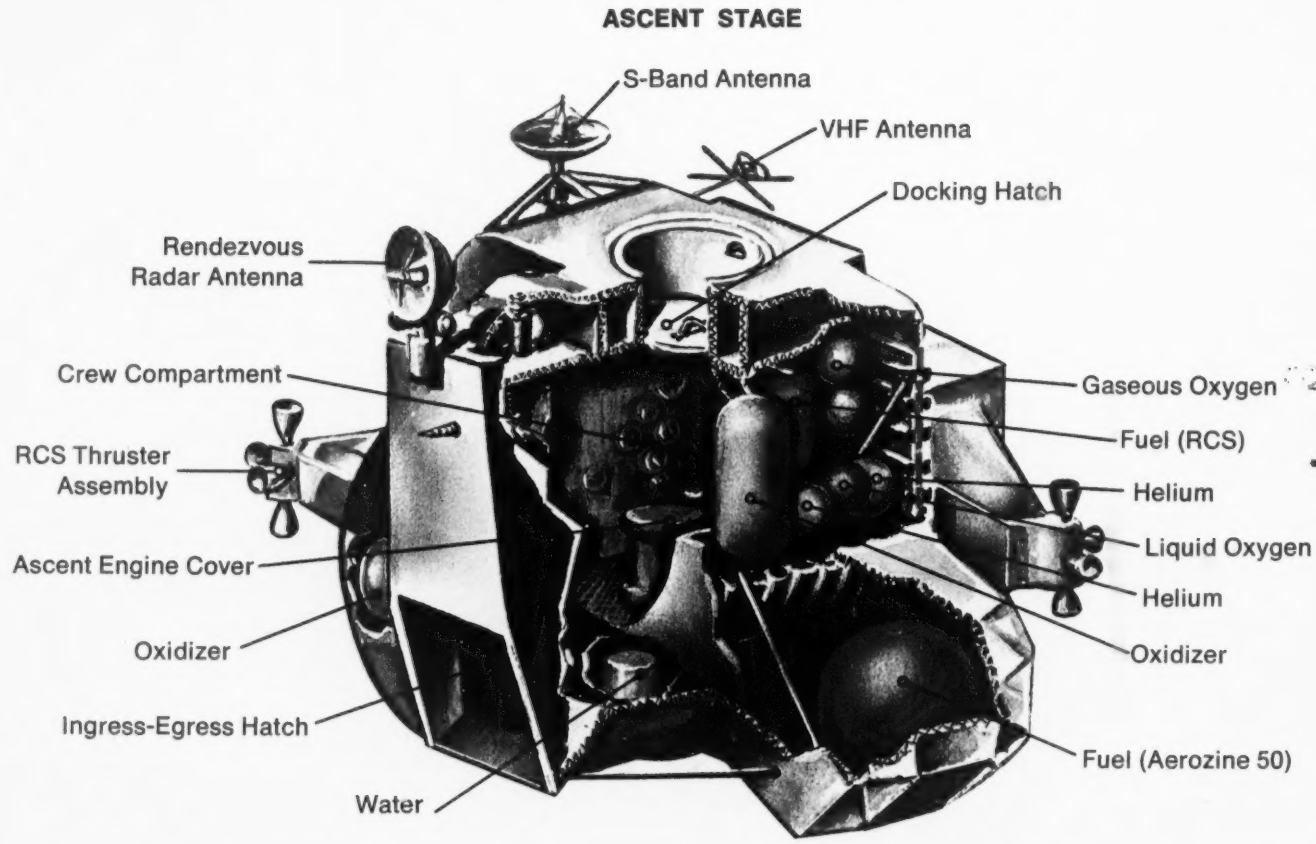
9

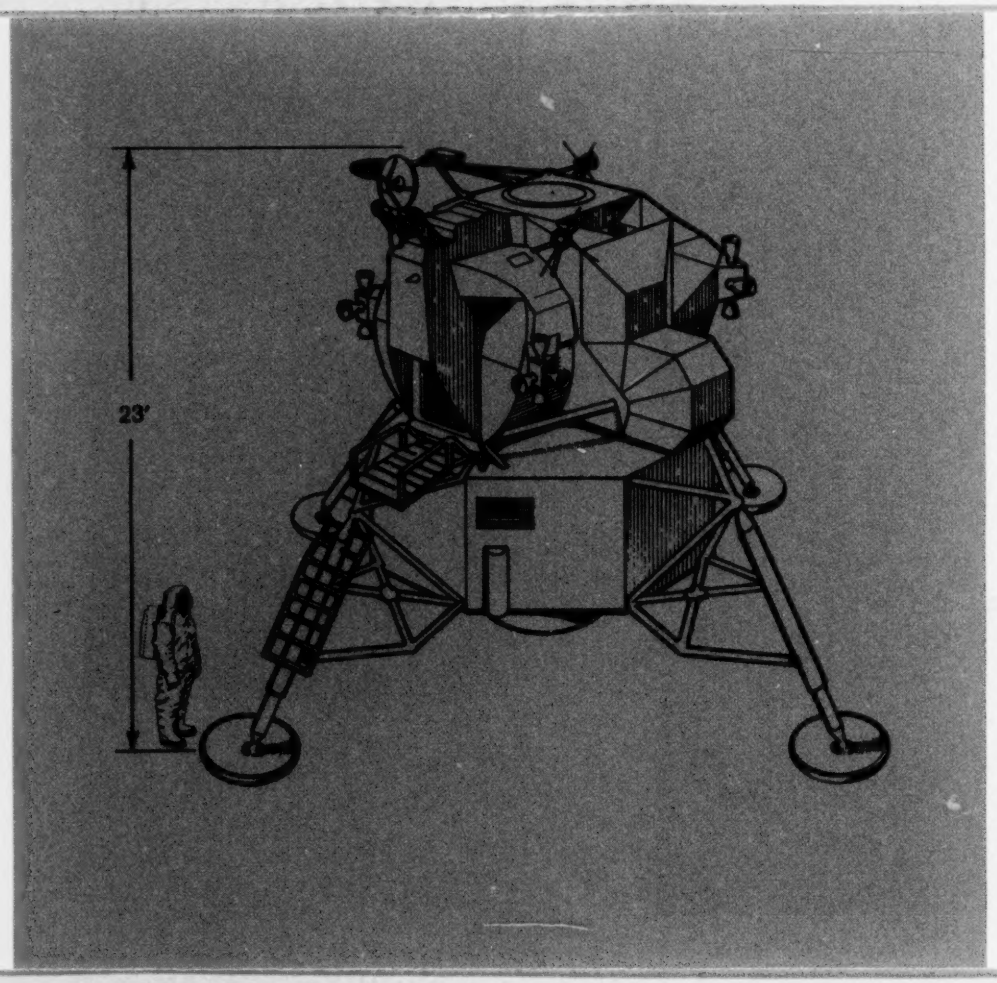
Friend Spider

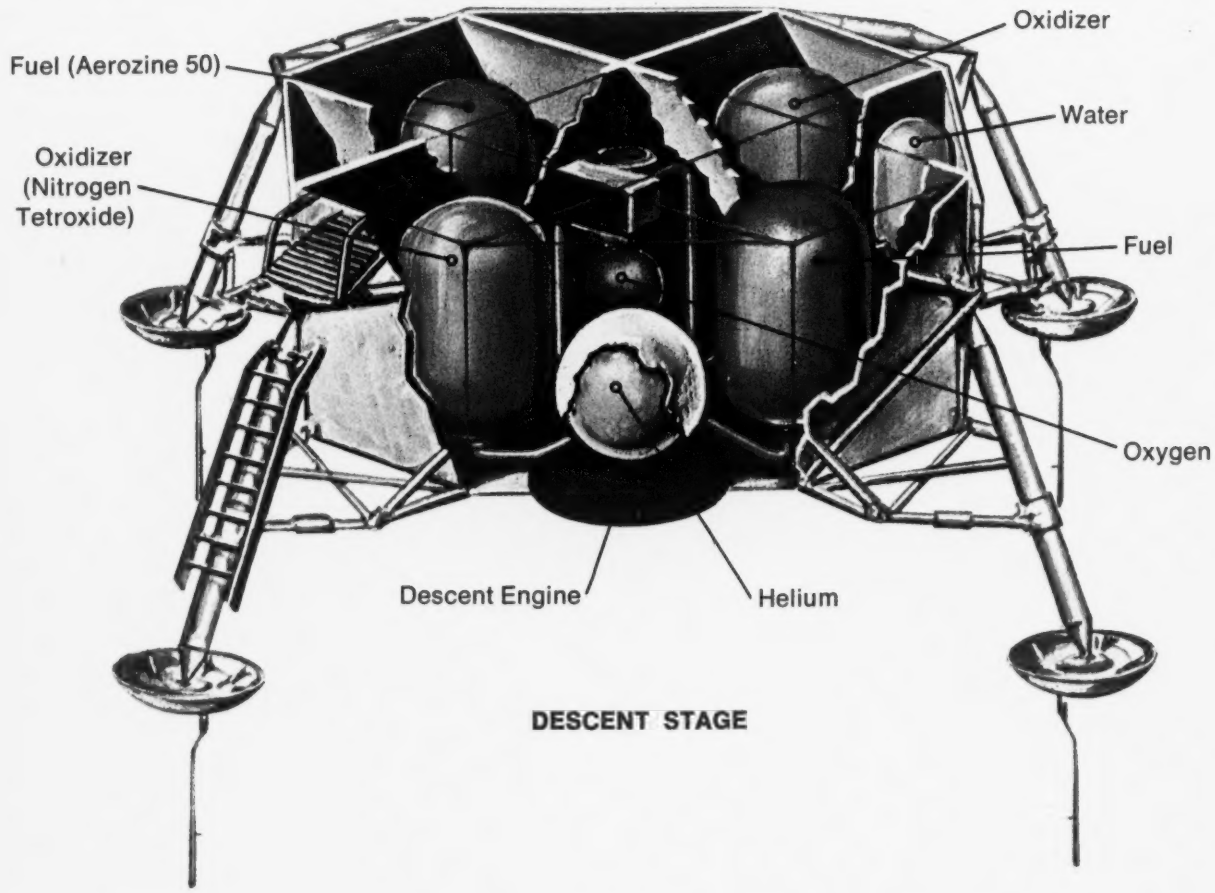
Scott's friend the Lunar Module may indeed be the ungainliest craft ever to carry men in space, but it also is the first true manned spacecraft. Other spacecraft, like the Spider's mother ship, are shaped to bear the searing heat of re-entering the Earth's atmosphere. The Spider, because it will fly only in space, is designed to perform its functions without the re-entry restriction. It may resemble an earthling's nightmare of a visitor from another planet.

Six antennas, 18 rockets, and four spidery legs jut from its oddly-angled slab sides, which, patterned in gold and black, control the heat in the unimpeded light of the Sun. It weighs 16 tons and stands 23 feet high, incorporating 25 miles of wiring and a million-odd parts.

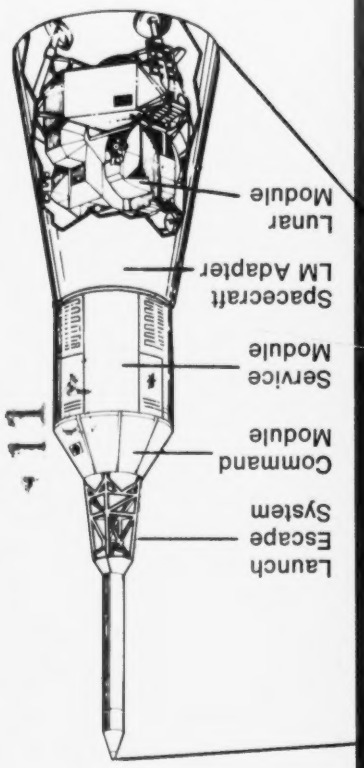
For easing the footpads and their 5-foot probes onto the Moon, LM's lower half houses a variable thrust rocket engine which enables it to hover like a helicopter. To launch themselves back to the Command Module in orbit of the Moon, the two astronauts will fire an engine in the upper half of the Lunar Module, using the lower half as their launch pad.







DESCENT STAGE


Launch Escape System
Command Module
Service Module
Spacecraft LM Adapter
Lunar Module

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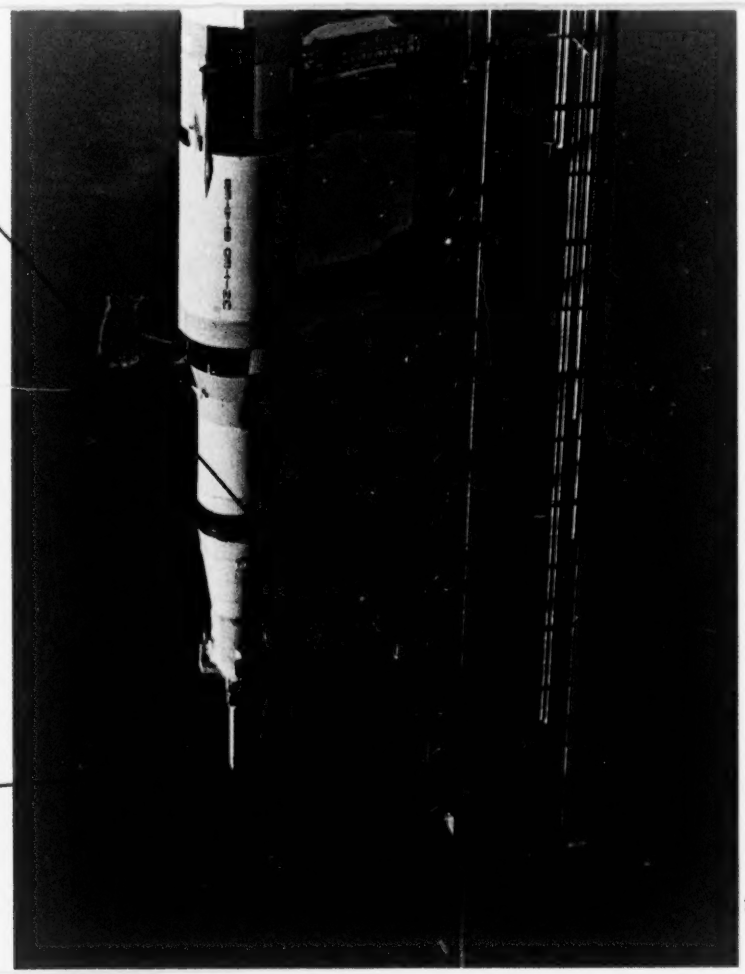

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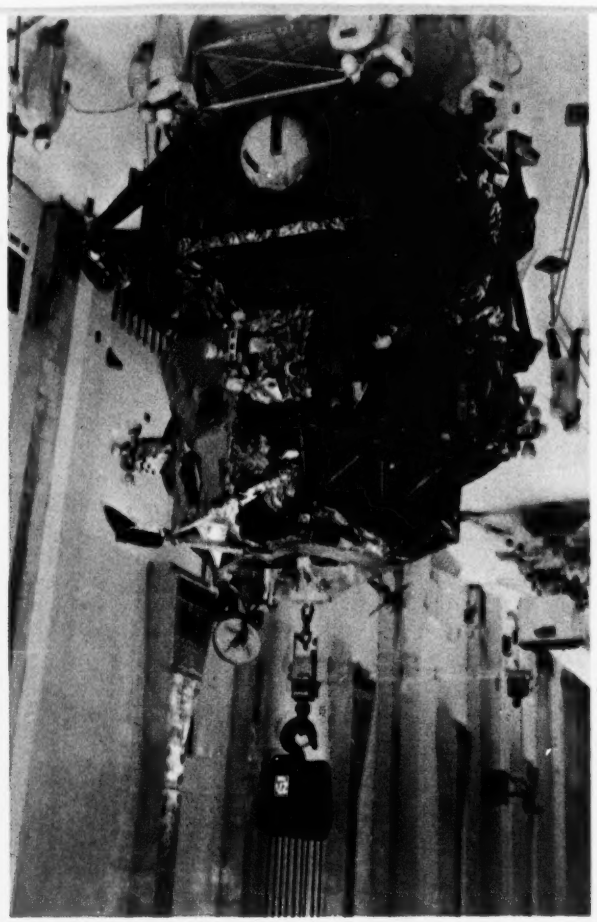

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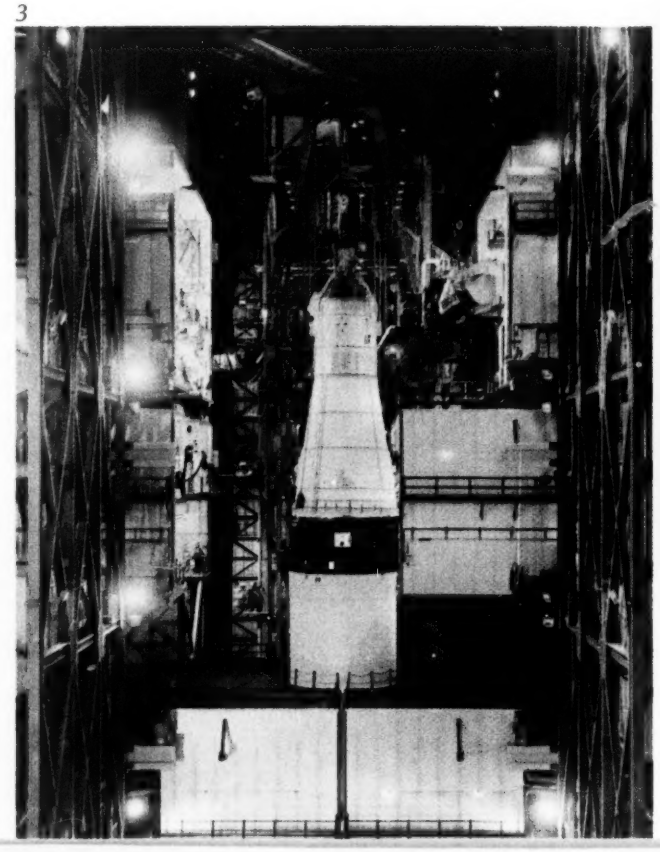
1. *Lunar Module ascent stage is prepared for test.*

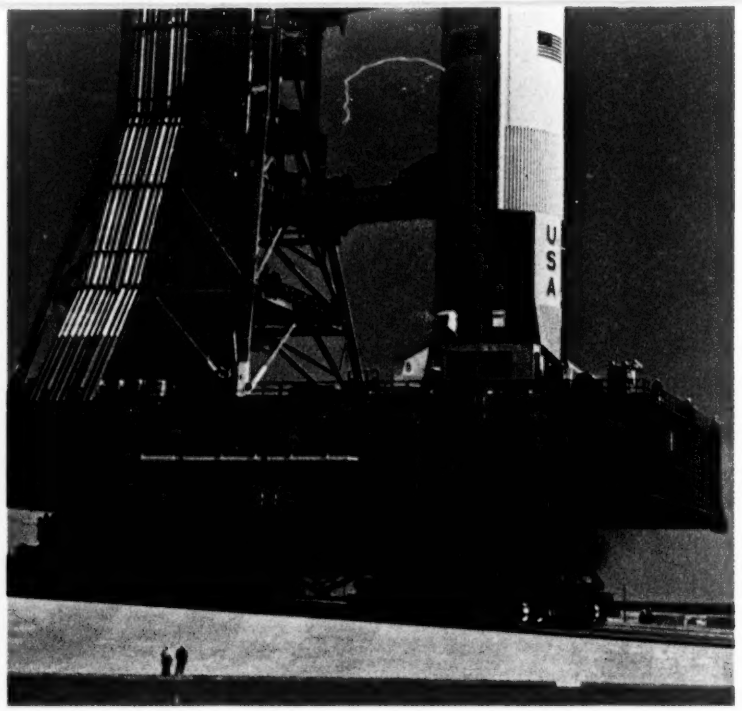
2. *Lunar Module during check-out.*

3. *Apollo 9 is mated to launch vehicle. Flaring out at bottom of Apollo is adapter that protects Lunar Module during flight through atmosphere.*

4. *Apollo 9/Saturn V vehicle on mobile launcher. Cutaway shows position of Lunar Module until extracted in space.*

3





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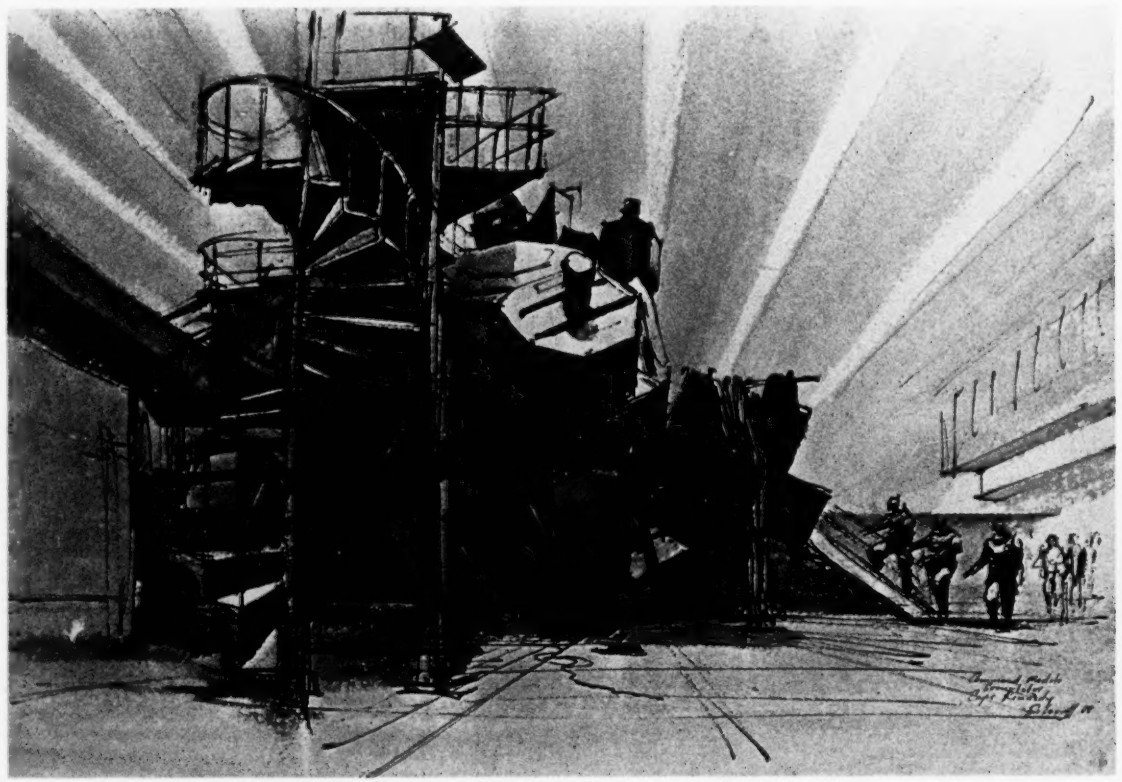

2

1. Artist Nicholas Solovioff's painting shows astronauts stepping up to Command Module Simulator at Kennedy Space Center (KSC).

2. Fish-eye lens gives all-inclusive view of McDivitt (foreground) and Schweickart in Lunar Module Simulator at KSC.

fig. 16

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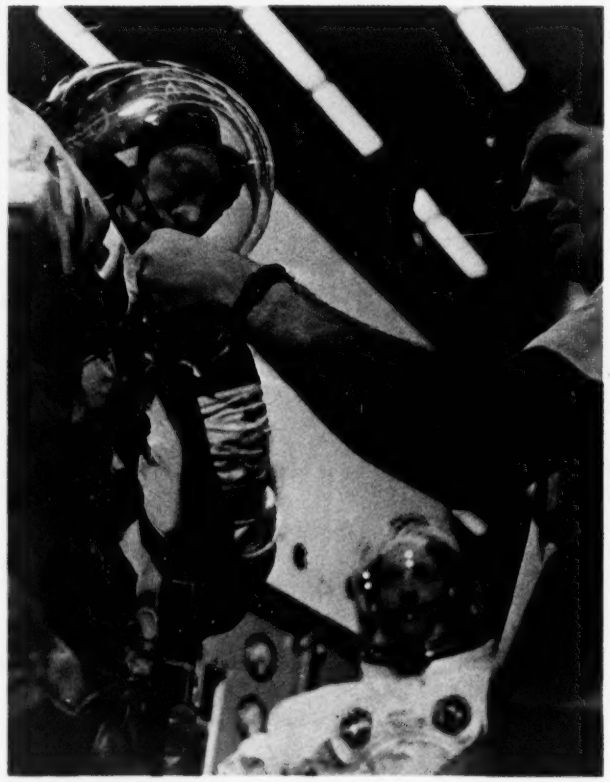
Shadow On The Moon

For every hour of the ten days that McDivitt, Scott, and Schweickart spent on Apollo 9's mission, they had put in three hours of realistic rehearsal on the ground. The Apollo crews practice in life-size working models of the LM and CSM with the illusion of actual space flight so complete that the LM, simulating descent to the Moon, casts a simulated shadow on a simulated moonscape.

The mockup spacecraft, suspended and moving about on columns of air, were linked to computers programmed to duplicate conditions at every stage of any planned Apollo mission. Men at the console of the computers could create emergencies for the astronauts to cope with. An arrangement of television cameras, lenses, magnifiers, and reflectors, projecting scale models of Earth, Moon and Stars, provided a precise image of what the astronauts could expect to see out their spacecraft windows.



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3. Schweickart (left) and McDivitt are suited up for simulator exercises.

4. From left, Schweickart, Scott, and McDivitt in Command Module Simulator.

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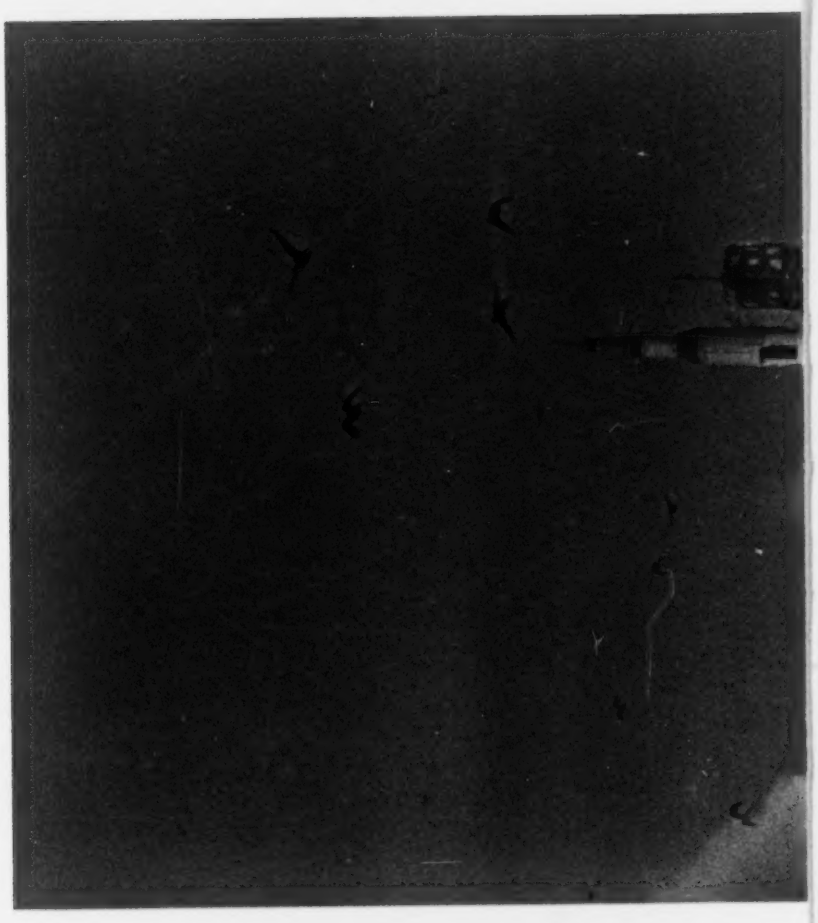

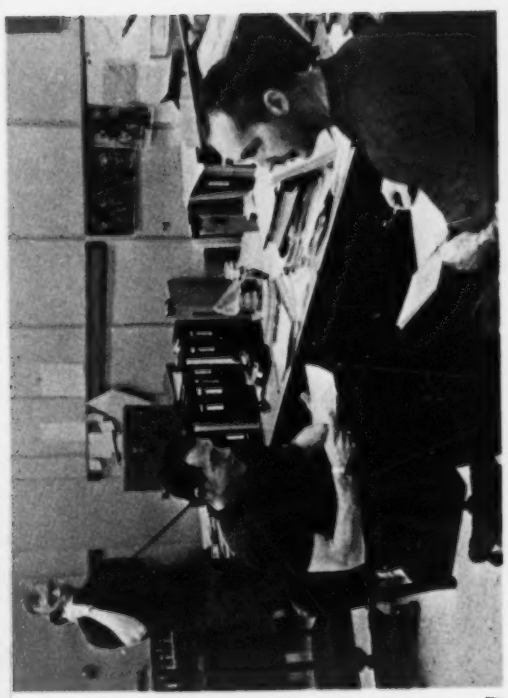

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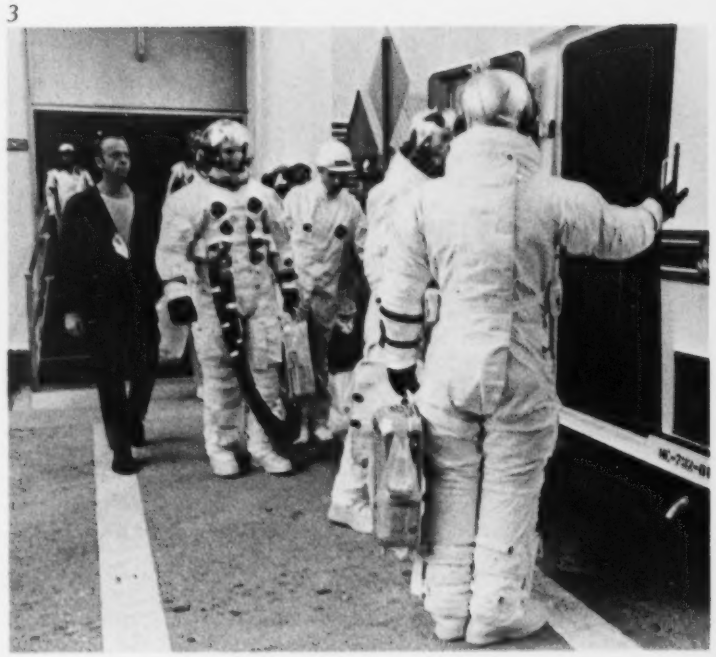
1. *Astronauts review flight plans. (L. to R.): Schweickart, Scott, and McDivitt.*

2. *Technician checks McDivitt's space suit.*

3. *Schweickart, Scott, and McDivitt (in space suits) about to enter transfer van that took them to launch pad.*

4. *Launch of Apollo 9, 11 a.m., March 3, 1969.*

3



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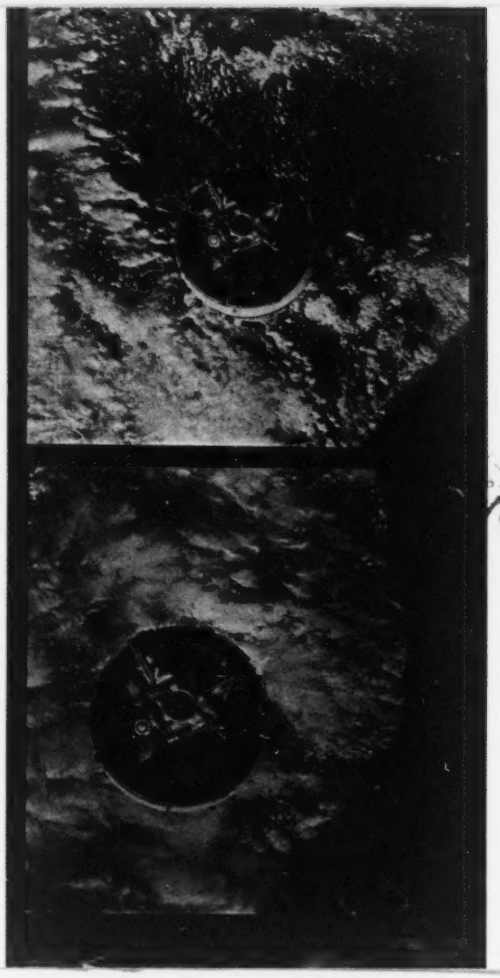
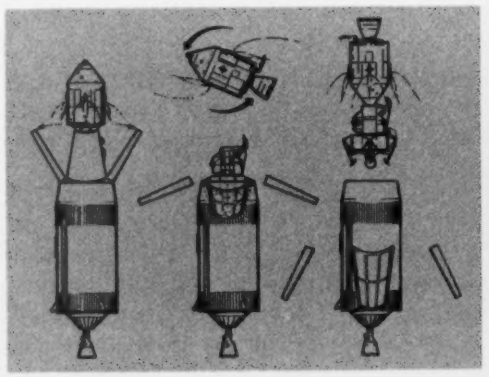


1. Launch Control Center, Kennedy Space Center, Florida, during Apollo 9 countdown.

2. Operations Control Center, Manned Space Flight Network at Goddard Space Flight Center, Greenbelt, Maryland. The network kept in touch with Apollo 9.

3. Mission Control Center, Manned Spacecraft Center, Houston, Texas, focal point for contact and monitoring during Apollo 9 flight.



Unveiling The Spider

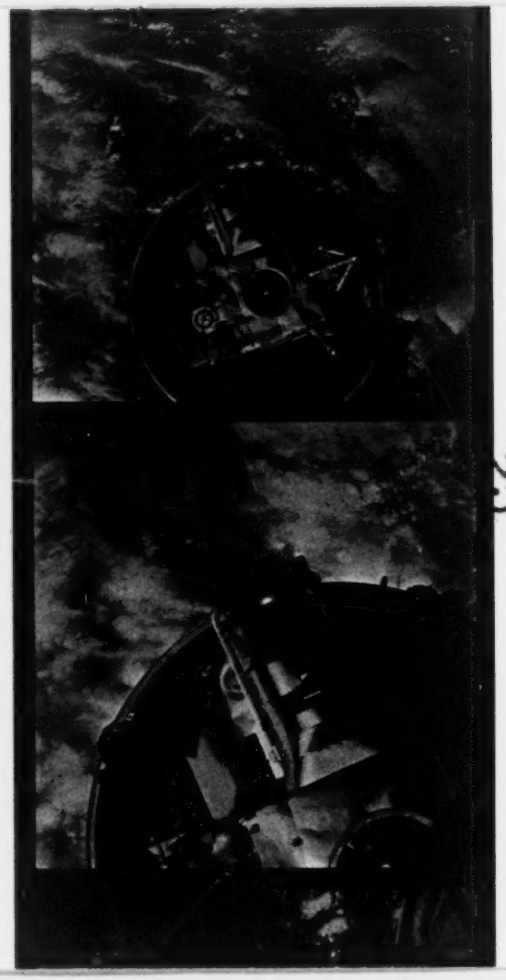
Three hours after the launch of Apollo 9, Gumdrop, in flawless sequence, pulled away from the Saturn 5's final stage, turned around in space, and hooked up with Spider. Explosive bolts fired and compressed springs propelled Spider like a jack-in-the-box from the rocket's third stage.

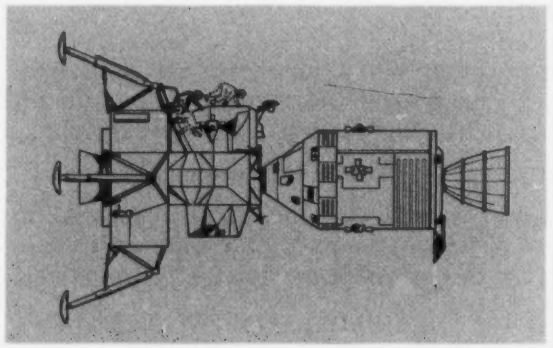
Head to head in orbit, Gumdrop and Spider tested the strength of their bond by firing Apollo 9's powerful engine at various angles like a dog's wagging tail. Scott radioed to Mission Control:

"You can feel the whole thing shake and vibrate, but it's pretty solid."

Three days into the mission Schweickart and McDivitt crawled through the tunnel into Spider to groom it for flight. They checked its electrical system and computer, extended its legs and fired its descent engine.

"We are about 25 feet now and are closing. All right, Houston, we're hard docked."—APOLLO 9





Red Rover And The Golden Slippers

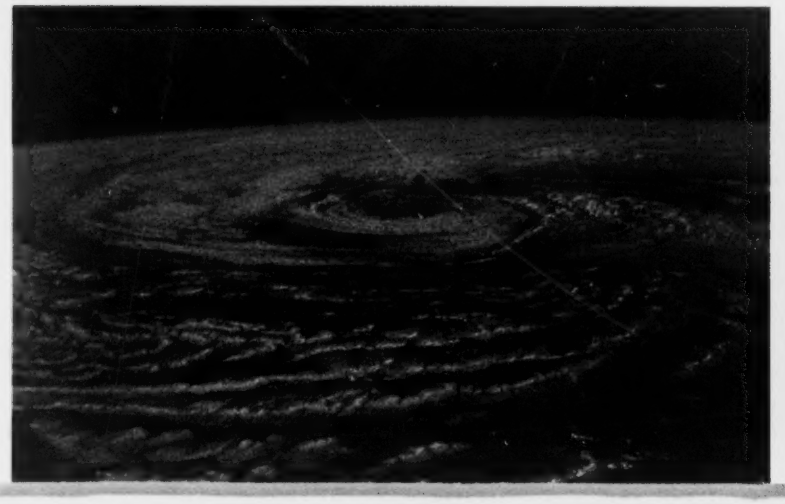
Schweickart's friends call him Rusty, not so much for his first name Russell as for the hue of his hair, and so for space-walking he was code-named Red Rover. He eased out of Spider's hatch 152 miles above the Pacific, back-packing the kind of 90-pound Portable Life Support System which will give air to astronauts on the Moon. He slipped his feet into the "golden slippers," gold-painted restraints outside the threshold, and, while photographing Apollo 9 and the Earth below, exulted:

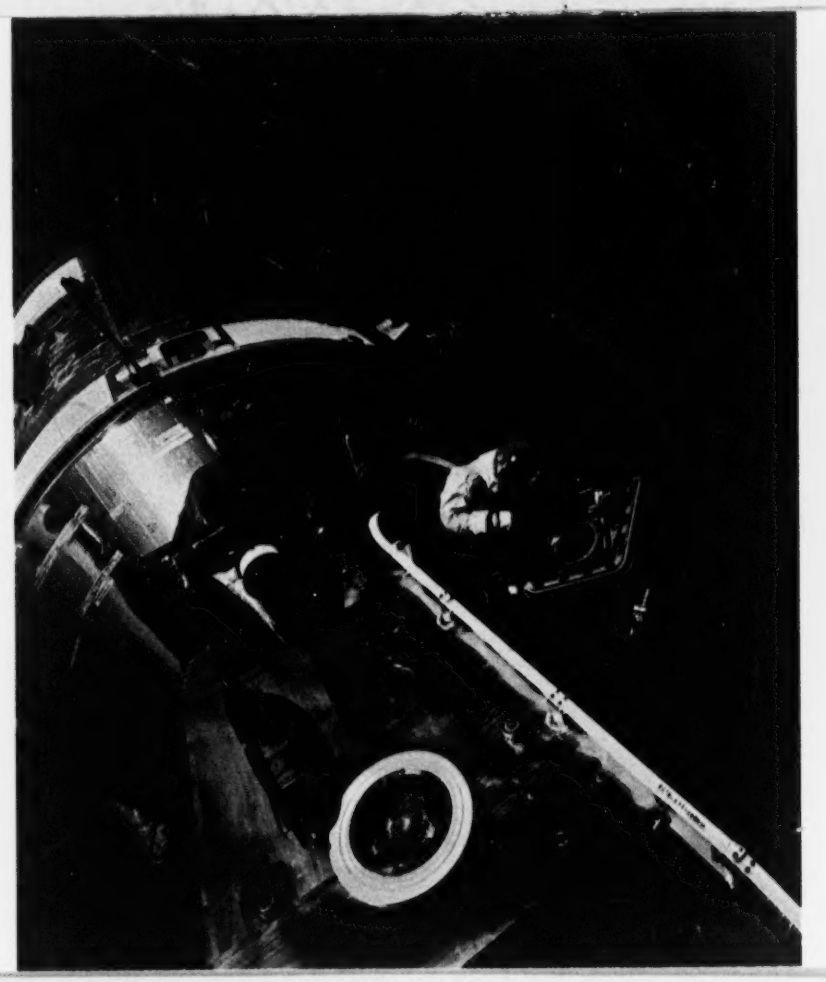
"Boy, oh boy, what a view!"

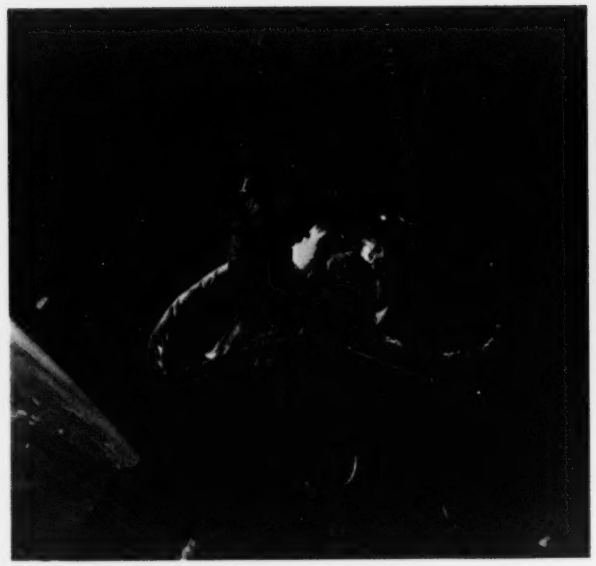
Scott, like Schweickart in gold-visored helmet to reflect the sunlight, poked his head out Gumdrop's side hatch. (see photo below). Then like tourists everywhere, they photographed each other.

"Boy, oh boy, what a view!"—RED ROVER

"The suit is very comfortable. The only things that are warm . . . are my hands and they are . . . not very hot at all."—RED ROVER

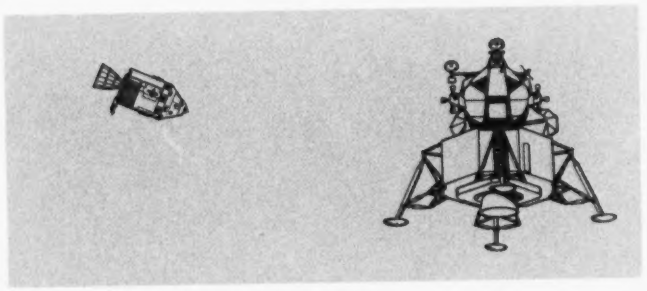






"I don't have any problem at all just maintaining myself wherever I want."—RED ROVER

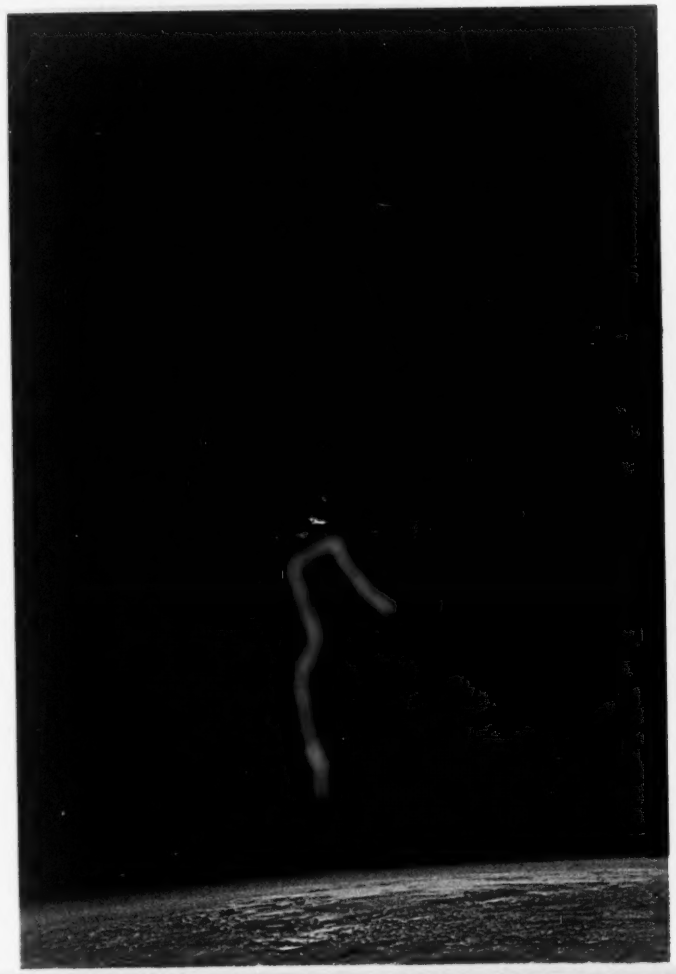
"Okay, Rusty, why don't you start coming in."
—SPIDER TO RED ROVER



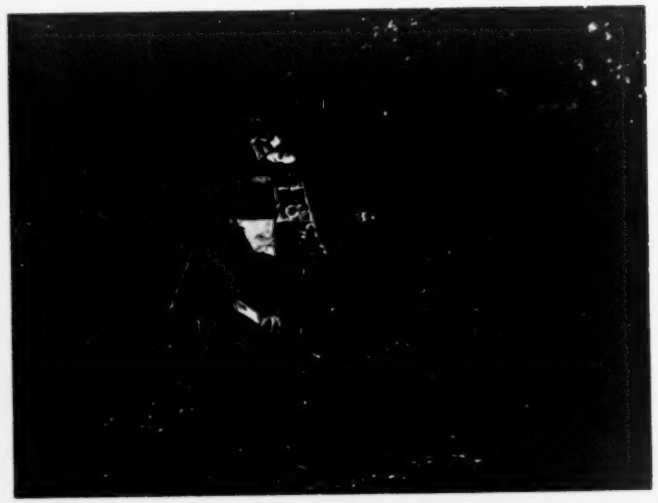
Spider Meets Gumdrop

On Spider's first lone venture into space, McDivitt and Schweickart began with programmed caution. After separating from Gumdrop, they gracefully rotated Spider like a fashion model so that Scott, from Gumdrop, could look it over. Then they pulsed the engine enough to put Spider three miles from the command ship in an orbit equidistant from Earth but almost parallel to Gumdrop's; twice each orbit, in event of trouble, Spider would be close enough to Gumdrop for Scott to rescue McDivitt and Schweickart.

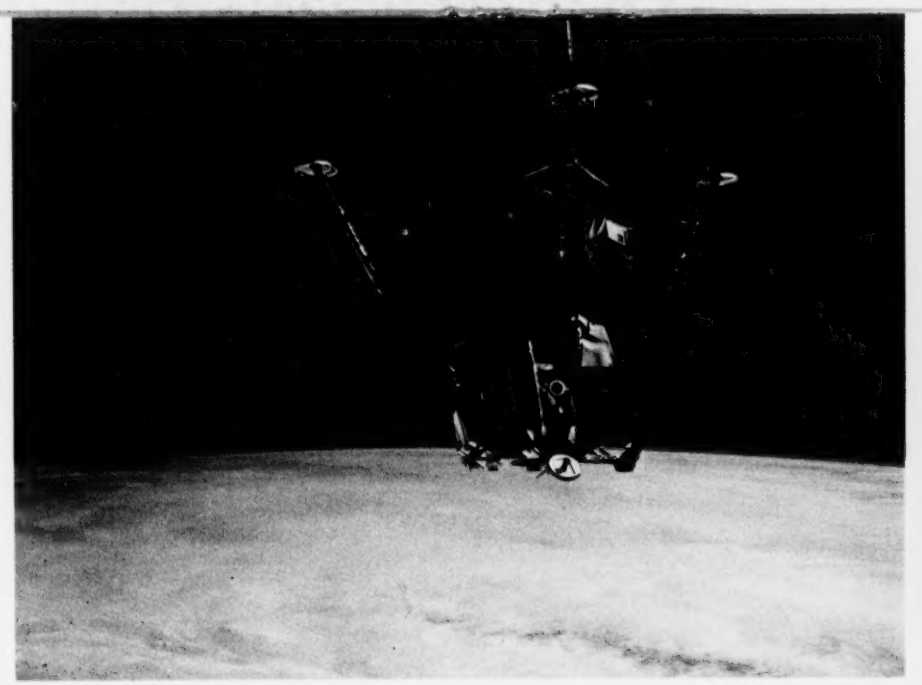
For nearly six hours while orbiting 135 miles above the Earth and up to 111 miles away from, and out of sight of, the mother ship, they put the Spider through its paces, simulating descent from lunar orbit to the Moon, the launch of the ascent stage from the Moon, and rendezvous with the Command Module circling the Moon.



"It's 49 miles and we can still see you."—SPIDER

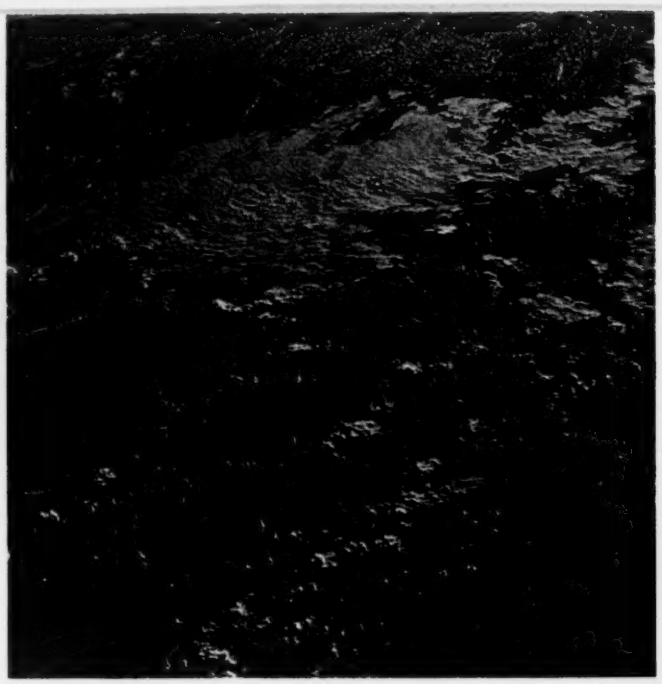


"It looks like a sporty little machine."—GUMDROP



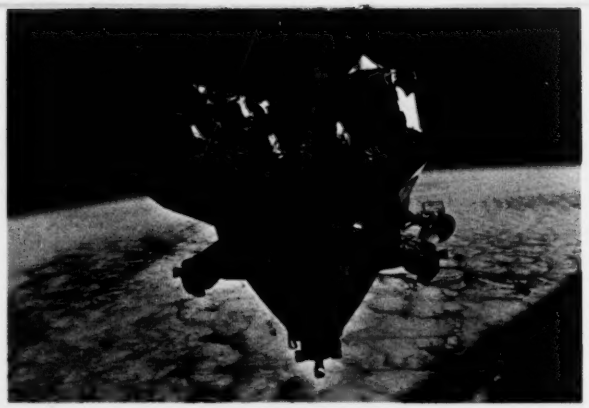
"You are upside down."—GUMDROP

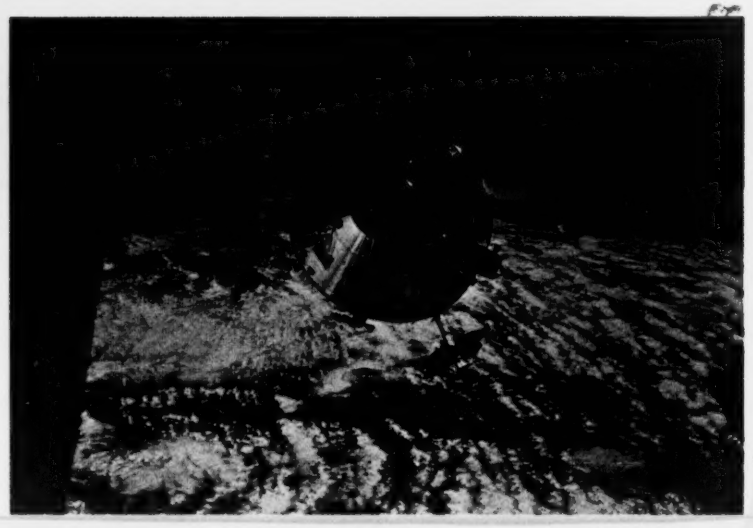
"I was just thinking, one of us isn't right side up."—SPIDER



"That was a very nice docking."—GUMDROP

"Dave, that wasn't a docking that was an eye test."—SPIDER



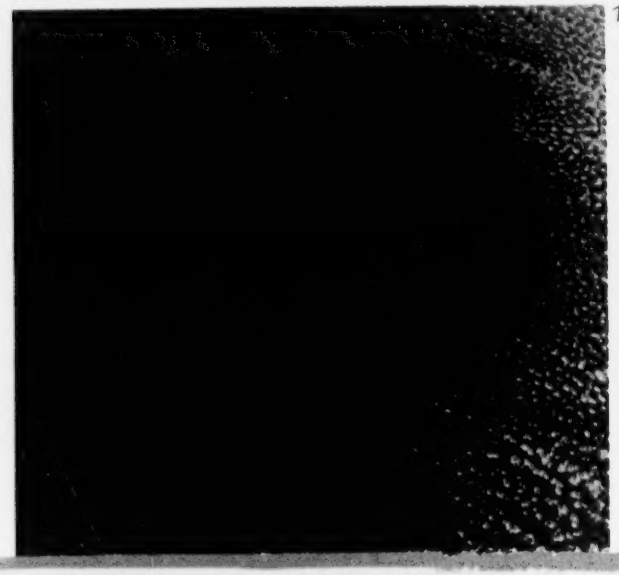


1. *"The states were really clear," the astronauts commented as they photographed the United States from coast to coast. Shown is Cape Hatteras, North Carolina.*

2-3. *In special experiments the astronauts photographed selected areas of the U.S. to gather data on Earth resources. Infra-red photo of the Colorado River mouth (2) shows healthy foliage as red patches. Normal color photo (3) of same area is shown. This could point the way for quickly identifying diseased or insect-infested foliage from space.*

4-5. *For the first time, splashdown and recovery were telecast live to a worldwide audience.*

1



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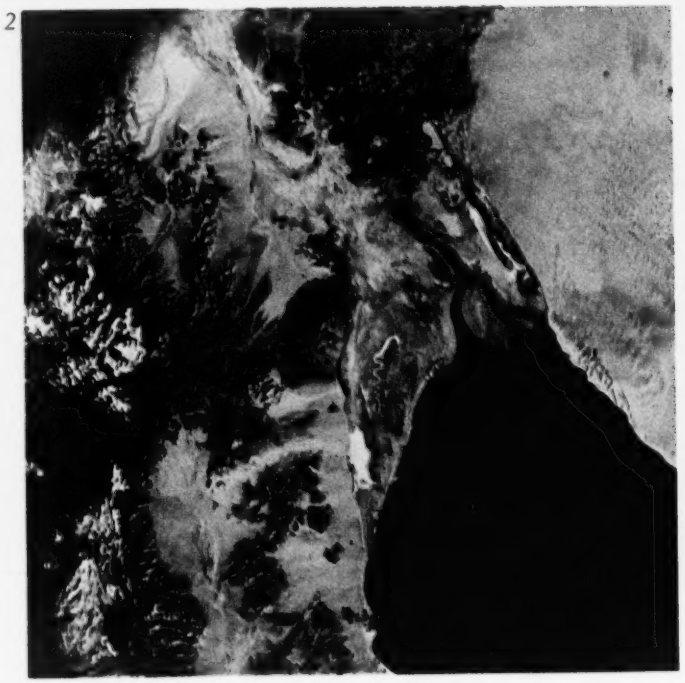

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4

5

". . . Ten Days That Thrilled The World"

If Apollo 9's first five days seem crowded, there was a reason: that major objectives might be achieved even if the mission had to be ended early. The first five days went so well that the astronauts, during the final five days, joked about their "banker's hours." But while the workload lightened, the remainder of the flight was taken up with landmark tracking and valuable experiments in Earth photography. The last five days also gave the crew opportunities to further checkout the Command Module in tests important to the Apollo Program.

At noon on March 13, 1969, Apollo 9 splashed down within three miles of the prime recovery ship USS Guadalcanal. President Nixon congratulated the astronauts declaring: "The epic flight of Apollo 9 will be recorded in history as 10 days that thrilled the world."

For now the Earth-orbital phase of the Apollo Program was ended. The next flight would take a Spider to within 10 miles of the surface of the Moon. Soon thereafter, another Spider will carry two Americans to the lunar surface, and Man for the first time will set foot on another celestial body.

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